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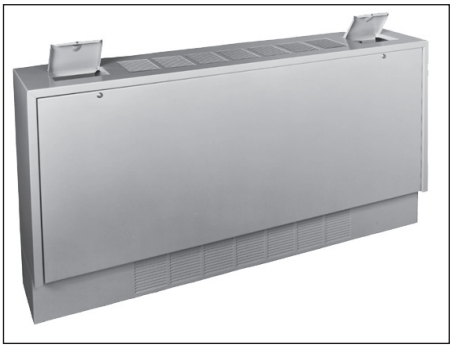
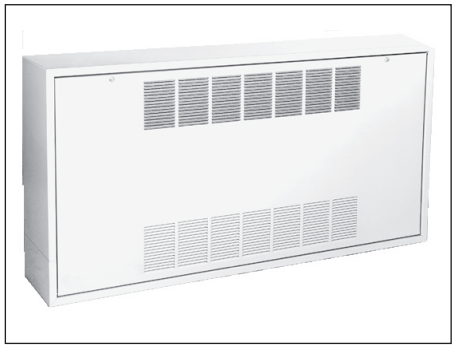
AIREDALE

INSTALLATION AND SERVICE MANUAL
steam/hot water cabinet unit heaters

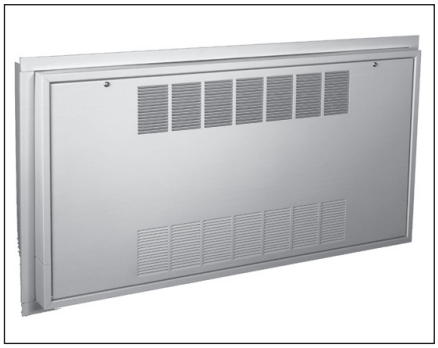
Floor Model FC
Sizes 002 thru 014



Wall or Ceiling Model WCC
Sizes 002 thru 014



Wall or Ceiling Recessed
Model WCC
Sizes 002 thru 014



Contents

General Information....1
Special Precautions....2
SI (Metric) Conversion Factors....2
Unit Location....2
Installation....3
- Unit Mounting....3
- Piping....3
- Wiring....3
- Mounting Height and Heater Throw....4

Operation....4
- Prior to Operation....4
- Initial Start-up....4
- Automatic Control Operations....4

Air Flow Arrangement....5
Controls and Features....6
Specifications....7
Dimensional/Motor Data....8
- Floor Model FC....8
- Wall or Ceiling Model WCC....9
- Dimensional Data/Accessories/Options....10
- Outside Air Wall Box....10
- Duct Collars....10

Maintenance....11
Service....11
Warranty....Back Page

IMPORTANT

The use of this manual is specifically intended for a qualified installation and service agency. A qualified installation and service agency must perform all installation and service of these appliances.

Inspection on Arrival

1. Inspect unit upon arrival. In case of damage, report immediately to transportation company and your local Modine Sales Representative.
2. Check rating plate on unit to verify that power supply meets available electric power at point of installation.
3. Inspect unit received for conformance with description of product ordered (including specifications where applicable).

General Information

Installation and service instructions in this manual are applicable to the three types of steam/hot water cabinet unit heaters which should be installed in their proper applications for their most effective function as heating units.

The condensers are warranted for operation at hot water pressures up to 200 lbs. per sq. in. gauge, and or temperatures up to 240°F or steam pressures up to 10psig.

Motors are designed for continuous duty. They can operate in a maximum ambient temperature of 104°F (40°C).

The unit heaters are listed by the Canadian Standards Association as certified.

Model FC units are fully exposed floor mounted types.

Model WCC units are fully exposed wall or ceiling mounted types, or partially of fully recessed.

Cabinet unit heaters are available with a variety of options and control arrangements. Information on certain options and controls (when provided) is supplied separately from this manual.

THIS MANUAL IS THE PROPERTY OF THE OWNER.
PLEASE BE SURE TO LEAVE IT WITH THE OWNER WHEN YOU LEAVE THE JOB.

SPECIAL PRECAUTIONS

THE INSTALLATION AND MAINTENANCE INSTRUCTIONS IN THIS MANUAL MUST BE FOLLOWED TO PROVIDE SAFE, EFFICIENT AND TROUBLE-FREE OPERATION. IN ADDITION, PARTICULAR CARE MUST BE EXERCISED REGARDING THE SPECIAL PRECAUTIONS LISTED BELOW. FAILURE TO PROPERLY ADDRESS THESE CRITICAL AREAS COULD RESULT IN PROPERTY DAMAGE OR LOSS, PERSONAL INJURY, OR DEATH. THESE INSTRUCTIONS ARE SUBJECT TO ANY MORE RESTRICTIVE LOCAL OR NATIONAL CODES.

HAZARD INTENSITY LEVELS

1. **DANGER:** Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.
2. **WARNING:** Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.
3. **CAUTION:** Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.
4. **IMPORTANT:** Indicates a situation which, if not avoided, MAY result in a potential safety concern.

⚠ DANGER

Units must not be installed where they may be exposed to a potentially explosive or flammable atmosphere.

⚠ WARNING

1. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
2. All appliances must be wired strictly in accordance with wiring diagram furnished with the appliance. Any wiring different from the wiring diagram could result in a hazard to persons and property.
3. Any original factory wiring that requires replacement must be replaced with wiring material having a temperature rating of at least 105°C.
4. When servicing or repairing this equipment, use only factory-approved service replacement parts. A complete replacement parts list may be obtained by contacting Modine Manufacturing Company. Refer to the rating plate on the appliance for complete appliance model number, serial number, and company address. Any substitution of parts or controls not approved by the factory will be at the owner's risk.

⚠ CAUTION

1. Do not reuse any electrical component which has been wet. Such component must be replaced.
2. Do not operate the units within steam pressure greater than 10 psig. Steam pressure must be 10 psig. or lower to avoid excessive discharge air temperatures that could cause burns or personal injury.

Table 2.1
SI (METRIC) CONVERSION FACTORS

To Convert	Multiply By	To Obtain
"W.C. (inches water column)	0.24	kPa
psig	6.893	kpa
°F	(°F-32) × 0.555	°C
inches	25.4	mm
feet	0.305	meters
CFM	0.028	m^3/min
CFH	1.699	m^3/min
btu/ft^3	0.0374	mJ/m^3
pound	0.453	kg
btu/hr	0.000293	kW/hr
gallons	3.785	liters

UNIT LOCATION

⚠ DANGER

Units must not be installed where they may be exposed to a potentially explosive or flammable atmosphere.

1. Units should not be installed in atmospheres where corrosive fumes or sprays are present.
2. Be sure no obstructions block air intake or air discharge of unit heater.
3. Columns, machinery, partitions, and other obstacles should not interfere with air streams from unit heaters.
4. Unit heaters installed in a building exposed to a prevailing wind should be located to direct a major volume of heated air along the windward wall of the building.
5. Vertical delivery unit heaters should generally be located in the central area of the space to be heated. Place horizontal delivery units along the walls of the same building where heat loss is usually greatest.
6. Arrange horizontal delivery units so they do not blow directly at occupants.
7. When only vertical delivery units are installed, they should be located so exposed walls are blanketed by their air streams.
8. Mounting height is critical for optimum performance. Refer to Mounting Height on page 4 before installation.

IMPORTANT

Start-up and adjustment procedures must be performed by a qualified service agency.

INSTALLATION - UNIT MOUNTING / PIPING / ELECTRICAL CONNECTIONS

INSTALLATION

Unit Mounting

1. Open front panel and line up end compartment with roughed-in piping and position unit at ceiling or wall location. (Hinged cabinet doors may be removed to facilitate unit installation.)
2. Fasten floor or wall mounted unit to wall studs through the four mounting holes in the back of the unit. For ceiling mounted units sizes 002-006, suspend four 1/4" threaded hanger studs from ceiling joists to match mounting holes in back of unit and fasten with lockwashers and hex nuts. (For sizes 008-014, use a 3/8" threaded rod.)

Perma-Lap® Frames

A Perma-Lap® frame (see Figure 10.3 on page 10) provides a finished appearance to a recessed wall or ceiling cabinet unit heater. The installation is easy and assures a perfect fit by neatly framing the heater and covering any irregularities between the heater and the opening in the wall or ceiling. Because the bond between wall or ceiling surfaces and the Perma-Lap® framing is permanent, there is no opportunity for air leakage which can cause wall streaking.

Since the enclosure front panel is never in contact with the wall or ceiling, servicing the heater involves simply removing the heater front panel and leaving the Perma-Lap® and cabinet enclosure permanently fixed in the recess opening.

Perma-Lap® frames allow flexibility in recessing depth. Enclosures may be flush, recessed or partially recessed. Desired unit projection on partially recessed units is accomplished by positioning the unit within the Perma-Lap® frame. The four sided Perma-Lap® frame has a 3/8" projection and a 1 ½" width.

Piping

⚠ CAUTION

1. Do not reuse any electrical component which has been wet. Such component must be replaced.
2. Do not operate the units within steam pressure greater than 10 psig. Steam pressure must be 10 psig. or lower to avoid excessive discharge air temperatures that could cause burns or personal injury.

1. On standard coil (single row), connections are 3/4" MPT on unit sizes 002 through 006.

   On high capacity coil (2 row), connections are 5/8" ID sweat on unit sizes 002 through 006.

   On unit sizes 008 through 014, either standard or high capacity coil, connections are 1" MPT.
2. Supply and return lines should be adequately sized to handle heating requirements under maximum load.
3. Attach air vent fitting at the high point of the piping in the unit on hot water systems.
4. Install piping to provide for expansion and contraction normally encountered with temperature changes.

Electrical Connections

⚠ WARNING

1. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
2. All appliances must be wired strictly in accordance with wiring diagram furnished with the appliance. Any wiring different from the wiring diagram could result in a hazard to persons and property.
3. Any original factory wiring that requires replacement must be replaced with wiring material having a temperature rating of at least 105°C.

⚠ CAUTION

Failure to wire this unit according to this wiring diagram may result in injury to the installer or user. For deviations, contact the factory.

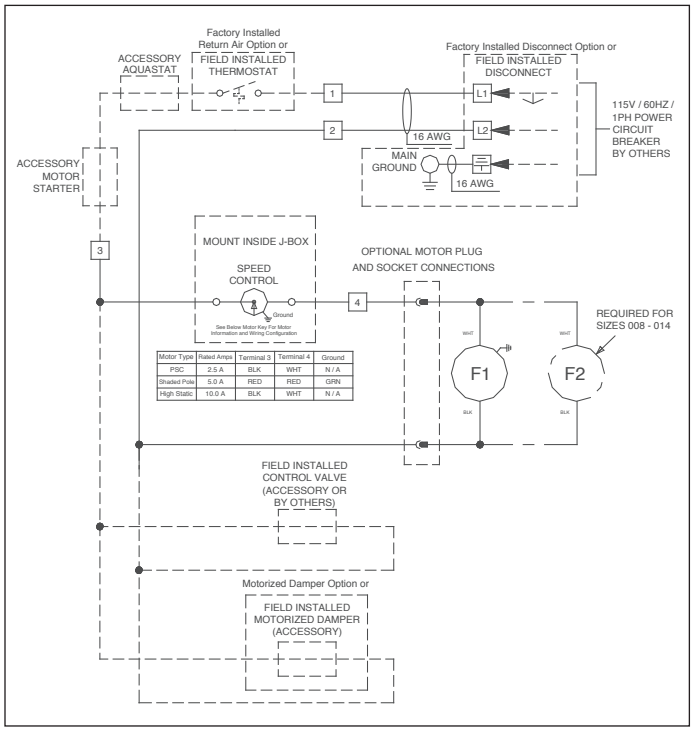
1. Installation of wiring must conform with local building codes, or in the absence of local codes, with the National Electric Code ANSI/NFPA 70 - Latest Edition. Unit must be electrically grounded in conformance to this code. In Canada, wiring must comply with CSA C22.1, Electrical Code.
2. Electric wiring must be sized to carry the full load amp draw of the motor and any controls that are used with the unit heater. Overcurrent protectors should be sized based on motor current rating shown on the unit serial plate, and applicable national electric code procedures.

   All units are provided with an electrical junction box. Make wiring connections from 115V/60Hz/1Ø building service to control box as shown on wiring diagram furnished with the unit.

   Any damage to or failure of Modine units caused by incorrect wiring of the units is not covered by Modine's standard warranty.
3. Location of room thermostat, when supplied, should be in the natural circulating path of room air. Mount thermostat about five feet above floor level where it will not be affected by heat from the unit or other sources of drafts that would prevent it from properly controlling room temperature. See instructions packed with the thermostat.
4. With ceiling mounted units, a multi-speed remote fan switch is supplied as standard. The switch can be recessed into a standard 2 x 4 electrical wall box.

Figure 3.1

Standard Wiring Diagram for Cabinet Unit Heaters



Motor Type	Rated Amps	Terminal 3	Terminal 4	Ground
PSC	2.5 A	BLK	WHT	N / A
Shaded Pole	5.0 A	RED	RED	GRN
High Static	10.0 A	BLK	WHT	N / A

INSTALLATION - MOUNTING HEIGHT / OPERATION

Mounting Height

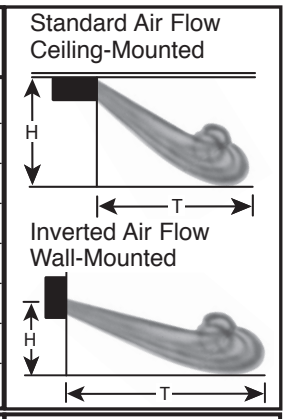
Height at which cabinet unit heaters are installed is critical. Maximum mounting heights for all units are listed in the tables below. The data in tables are based on operating conditions of 2 lbs. steam or 220°F entering water with 60°F entering air. When operating conditions are other than those above, refer to chart for mounting height correction factor. To obtain the maximum mounting height at actual operating conditions, multiply the appropriate factor from chart by the mounting height in Tables. The mounting heights must be followed closely to assure maximum comfort.

Strong opposing drafts, large obstructions in the air stream of the unit, and higher than normal discharge air temperatures (resulting from high steam pressures) can prevent the heated air discharged by the cabinet unit from reaching the floor.

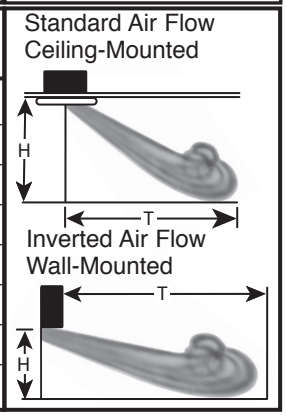
Under unfavorable conditions such as these, allowances must be made to assure maintenance of desired comfort.

Table / Figure 4.1 - Maximum Mounting Height ①

Size	H (Ft.)	T (Ft.)
002	8	15
003	8	18
004	9	22
006	9	23
008	10	26
010	10	27
012	11	26
014	11	27



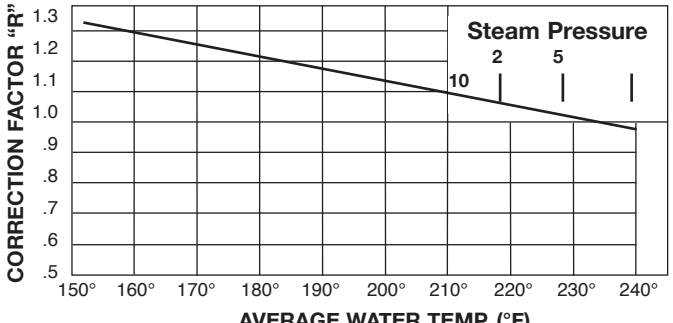
Size	H (Ft.)	T (Ft.)
002	7	8
003	8	10
004	8	11
006	8	12
008	10	16
010	10	18
012	11	20
014	11	21



① Maximum mounting height and corresponding heat throw of heaters operating at standard conditions (2 lbs. steam or 220°F entering water, 60° entering air).

Table 4.2
Maximum Mounting Heights Correction Factors

These correction factors are to be used as multipliers to correct the maximum recommended mounting heights "H" or heat throw "T" of cabinet unit heaters when operated with steam pressures other than 2 pounds or with water at other than entering temperature of 220°F.



OPERATION

1. Make sure fuses are installed in fused disconnect switches.
2. Check all electrical connections to assure they are secure.
3. Check rigidity of unit mounting. Tighten all fasteners, if necessary.
4. Inspect piping, strainers, traps, fittings, etc.

Initial Start-Up

1. Set thermostat to lowest position.
2. Turn on power supply to unit.
3. Open return gate valve, and then open supply gate valve to unit.
4. Raise thermostat setting to desired position.
5. Adjust louvers (if provided) for desired heat distribution.
6. To insure proper sequence of operation, cycle unit on and off a few times by raising and lowering thermostat setting.
7. Check for proper rotation of fan. See dimensional drawings on page 8 or 9 for indication of fan rotation.

Automatic Control Operations

Install one of the following operating systems for continuous automatic control.

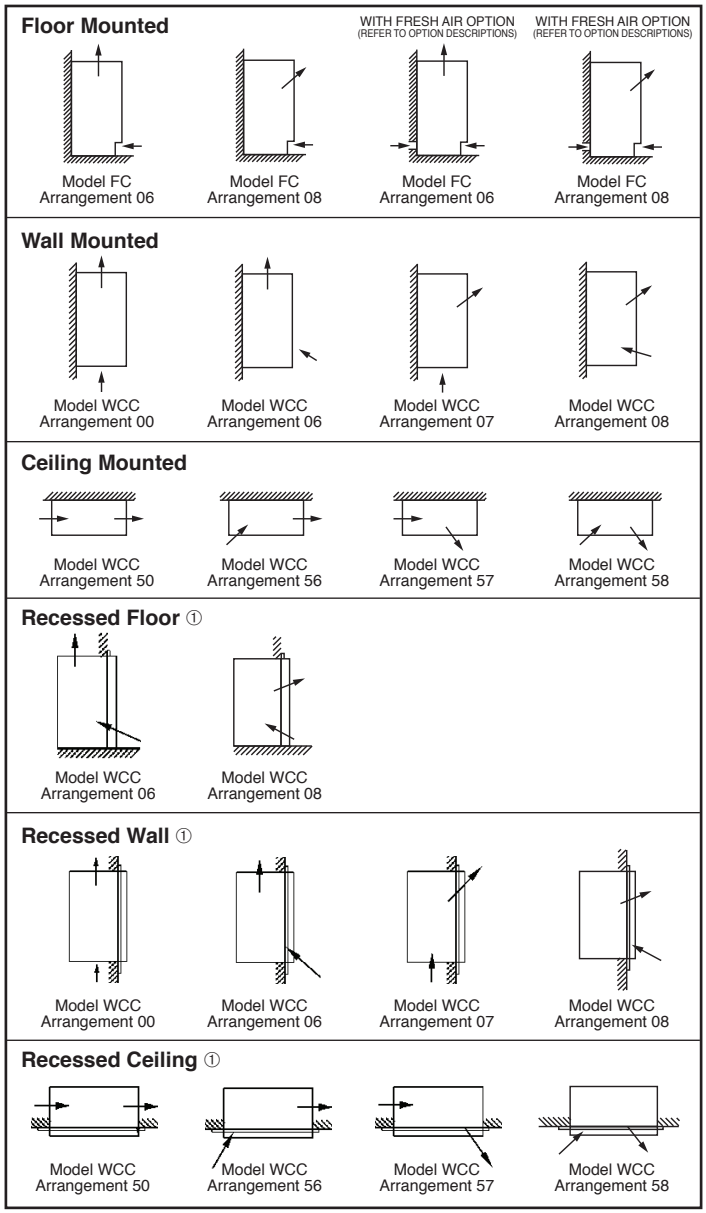
Intermittent Fan Operation — Hot Coil

A room thermostat starts and stops the fan motor. An aquastat is sometimes strapped to the return piping to prevent fan operation when heat is not being supplied to the unit heater.

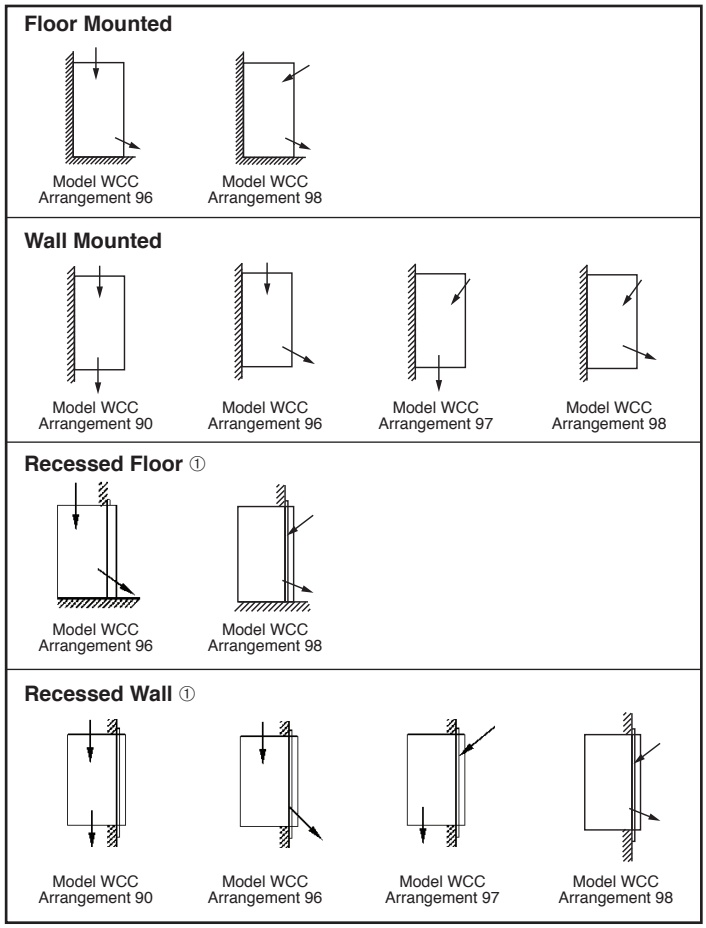
Continuous Fan Operation — Intermittent Hot/Cold Coil

A room thermostat controls a valve which opens to allow steam or hot water to supply the unit and closes to shut off the supply when the thermostat is satisfied.

INSTALLATION - AIR FLOW ARRANGEMENTS


Floor Mounted
WITH FRESH AIR OPTION (REFER TO OPTION DESCRIPTIONS)
WITH FRESH AIR OPTION (REFER TO OPTION DESCRIPTIONS)
Model FC Arrangement 06
Model FC Arrangement 08
Model FC Arrangement 06
Model FC Arrangement 08
Wall Mounted
Model WCC Arrangement 00
Model WCC Arrangement 06
Model WCC Arrangement 07
Model WCC Arrangement 08
Ceiling Mounted
Model WCC Arrangement 50
Model WCC Arrangement 56
Model WCC Arrangement 57
Model WCC Arrangement 58
Recessed Floor ①
Model WCC Arrangement 06
Model WCC Arrangement 08
Recessed Wall ①
Model WCC Arrangement 00
Model WCC Arrangement 06
Model WCC Arrangement 07
Model WCC Arrangement 08
Recessed Ceiling ①
Model WCC Arrangement 50
Model WCC Arrangement 56
Model WCC Arrangement 57
Model WCC Arrangement 58

① Perma-Lap® frame available for recessed units.



① Perma-Lap® frame available for recessed units.

Figure 5.3 - Model Nomenclature

1,2,3	4,5,6	7	8	9	10	11	12	13	14	15	16	17	18
MT	CFM	ADO	ADT	DS	IS	OS	AS	CR	HM	PF	MT	LB	OA

1,2 - Model Type (MT)
FC - Pedestal Style
WCC - Exposed, Recessed, or Ceiling Unit

4,5,6 - Nominal Air Flow (CFM)
002 - 250 CFM
003 - 330 CFM
004 - 450 CFM
006 - 620 CFM
008 - 840 CFM
010 - 1050 CFM
012 - 1240 CFM
014 - 1430 CFM

7 - Arrangement Digit One (ADO)
0 - Wall or Floor
5 - Ceiling
9 - Inverted

8 - Arrangement Digit Two (ADT)
0 - Bottom In, Top Out
6 - Front In, Top Out
7 - Bottom In, Front Out
8 - Front In, Front Out

9 - Development Sequence (DS)
A - Current

10 - Inlet Style (IS)
L - Louvers
B - Bar Grille
D - Duct Collar

11 - Outlet Style (OS)
L - Louvers
B - Bar Grille
D - Duct Collar
A - Adjustable Louvers

12 - Access Side (AS)
L - Left
R - Right

13 - Coil Rows (CR)
1 - 1 Row Coil
2 - 2 Row Coil

14 - Access Doors (AD)
1 - None
2 - Top
3 - Front Panel
4 - Top with Key Locks
5 - Front Panel with Key Locks

15 - Panel Fasteners (PF)
0 - None
1 - Spanner Head
2 - Key Locks

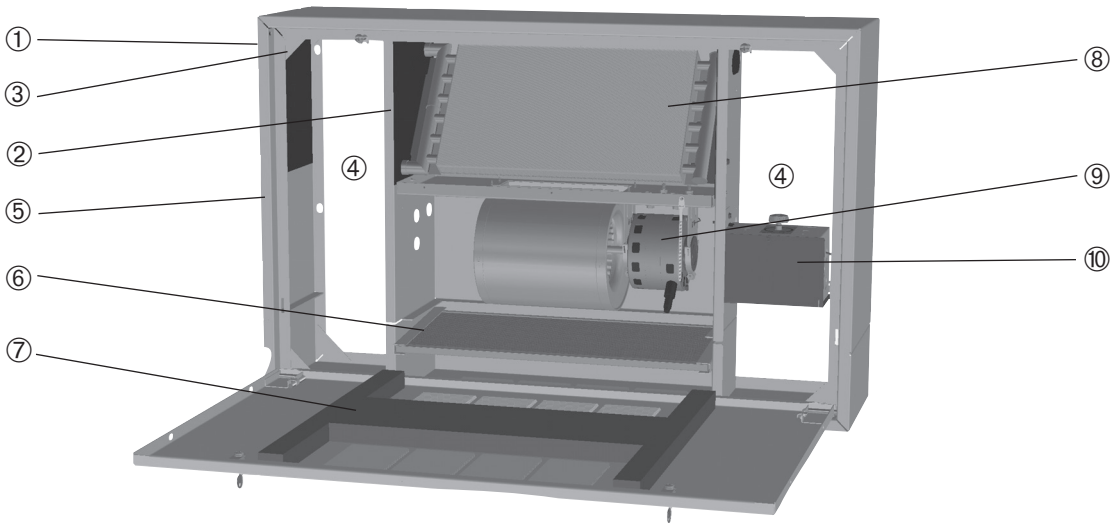
16 - Motor Type (MT)
S - Shaded Pole
P - PSC
H - High Static
G - Shaded Pole with Plug-In Leads
F - PSC with Plug-In Leads
I - High Static with Plug-In Leads

17 - Leveling Bolts (LB)
0 - None
1 - Leveling Bolts

18 - Outside Air (OA)
0 - None
1 - 25% OA Duct Collar
2 - 100% OA Duct Collar
3 - 25% OA Manual Damper
4 - 100% OA Manual Damper
5 - 100% OA Motorized Damper
6 - 25% OA Motorized Damper

CONTROLS AND FEATURES

Figure 6.1
Controls and Features



① **One-Piece Cabinet Top and Sides (STD)**
Cabinet top and sides are formed from a single sheet of 18 gauge steel reducing the number of parting lines common to multi-piece construction. Fronts are 16 gauge. All louvers are stamped as standard.

② **Wrap-Around Partitions and Back Sheet (STD)**
Inner partition panels and back sheet are die-formed from a single sheet of 18 gauge steel. This assures precision fit and alignment of all internal components and maximum cabinet rigidity.

③ **All-Welded Construction (STD)**
Cabinet unit heaters utilize five to eight structural components in the basic cabinet. The components are fixture-aligned and welded.

④ **Cabinet End Pockets (STD)**
The two cabinet end pockets provide ample space for convenient installation of piping and electrical wiring. Easy access reduces costs and installation time.

⑤ **Cabinet Finish (STD)**
After assembly and welding operations are completed, the entire cabinet unit is treated for prevention of rust and corrosion. Entire cabinet is finished with a tan color, durable polyester powder-coat paint.

⑥ **Quick-Change Permanent Filters (STD)**
Filters are removable without tools. After opening the unit's front panel, the filter easily slides out. Cleanable filters are provided as standard.

⑦ **Insulation (STD)**
Sound dampening insulation on all front panels.

⑧ **Coils – Steam/Hot Water (STD)**
All coils used in cabinet heaters use copper tube, aluminum fin construction with NPT connections; 3/4" for sizes 2 thru 6, and 1" for sizes 8 thru 14. Tubes are mechanically expanded into integral fin collars. Return bends and joints are silver alloy brazed and the coil is pressure-tested to 200 psi pressure. Field reversible coils allow piping to be made for left or right side connection, with left hand piping as factory standard.

⑨ **Power Assembly (STD)**
Blower platform, blower, and blower motor on all sizes are removable as a single unit. A direct drive, multi-speed, shaded pole motor with built in thermal overload protection powers the forward curved aluminum blower wheels. Right hand electrical as factory standard.

⑩ **Speed Control (STD)**
Solid state infinite speed control with off position.

⑪ **Access Doors (not shown) (STD)**
Tilt type access doors standard on Model FC units.

UNIT / MECHANICAL SPECIFICATIONS

Table 7.1
Unit Data Specifications

Unit Size ▶	002	003	004	006	008	010	012	014
Coil								
Standard – 1 Row Face Area, Ft.²	1.0	1.3	1.6	2.3	3.4	3.4	4.6	4.6
High Capacity – 2 Row Face Area, Ft.²	1.1	1.5	1.8	2.7	3.6	3.6	4.8	4.8
Standard Coil Connections	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT	1" NPT	1" NPT	1" NPT	1" NPT
High Capacity Coil Connections	5/8" ID Sweat	5/8" ID Sweat	5/8" ID Sweat	5/8" ID Sweat	1" NPT	1" NPT	1" NPT	1" NPT
Blowers (Direct Drive)								
No./Dia. x Width (Inches)	1 / 5-1/4 x 7	1 / 5-3/4 x 7	2 / 5-1/4 x 7	2 / 5-3/4 x 7	3 / 5-3/4 x 7	3 / 5-3/4 x 7	4 / 5-3/4 x 7	4 / 5-3/4 x 7
High Speed (Rpm)	1050	1050	1050	1050	1050	1050	1050	1050
Low Speed (Rpm) ①	625	625	625	625	625	625	625	625
High CFM	250	330	450	620	840	1050	1240	1430
Low CFM ①	150	195	270	370	545	685	805	930
② ③ **Motor HP**	1/30	1/30	1/20	1/20	1/30 1/20	1/30 1/20	1/20	1/20
Volts/Phase/Hertz	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60
Amps, Standard Shaded Pole Motors	1.7	1.7	2.1	2.1	3.8	3.8	4.2	4.2
Amps, PSC Motor	.7	.7	1.05	1.05	1.75	1.75	2.1	2.1
Amps, High Static Motor	4.4	4.4	4.4	4.4	8.8	8.8	8.8	8.8
Shipping Weight – Lbs.								
Model FC	80	90	110	120	160	165	185	190
Model WCC	90	100	120	130	170	175	195	200

① Standard solid state speed control offers infinite speed control between high and low speed/CFM.
② Sizes 002-006 have one motor. Sizes 008-014 have two motors.
③ High Static Motors are .4 HP for sizes 002-006 and .8 HP for sizes 008-014.

Unit Mechanical Specifications

Cabinet

Floor models shall be provided with stamped louvers and a one inch high dust barrier at the bottom. The cabinet shall be 18-gauge steel with 16 gauge front panels. All painted surfaces shall be treated for corrosion resistance prior to being finished with a tan, baked on enamel finish, which may be used as a final coat or repainted. All unpainted steel shall be galvanized. (When specified) color as selected by architect shall be provided in one of 9 optional colors as shown on manufacturer's color chart 75-403.

Wall or ceiling models shall have cabinets with stamped louvers. The entire bottom of the unit must be enclosed. Access to the speed control shall be through the easy access 16-gauge front panels.

(Available, when specified, as optional equipment) an access door shall be provided for speed control access.

All models shall have two 9" minimum wide piping end pockets. All wall and ceiling units shall have safety hinged access panels that can be easily removed during installation.

Coils

The heating coils shall provide specified capacities and not exceed the pressure drop and GPM listed in this catalog. Coils shall be suitable for 200 PSI working pressure with 240°F water.
Steam pressure shall not exceed 10 psi.

Motor Speed Control

The unit shall have a unit-mounted solid state motor speed control, with high through low speeds and off positions on all models.

Dampers (optional equipment)

When specified, the unit shall be equipped with a 25% or 100% galvanized steel fresh air blade damper. Model FC, floor units only.

When dampers are specified, indicate one of the following:

1. These dampers shall be controlled from the end pocket with a manual control assembly that indicates the open and closed positions.

2. The damper shall be controlled by an electric, spring-return type motor, which will be energized when the blower motor is turned on thus moving the damper to the 25% or 100% position. It will be de-energized and close the damper when the blower motor is off.

Motors, Blowers and Drives

Blowers shall be of the centrifugal, forward curved type, to provide even air distribution and low sound level.
All units shall have shaded pole (permanent split capacitor available when specified as optional equipment) direct-drive motors. The motor and blower assembly shall be capable of being easily removed from the unit. Motors are built for continuous duty to NEMA standards.

Grilles (optional equipment)

When specified, aluminum linear bar inlet and/or outlet grilles shall be provided.

When specified, outlet grilles may have two-way deflection louvers.

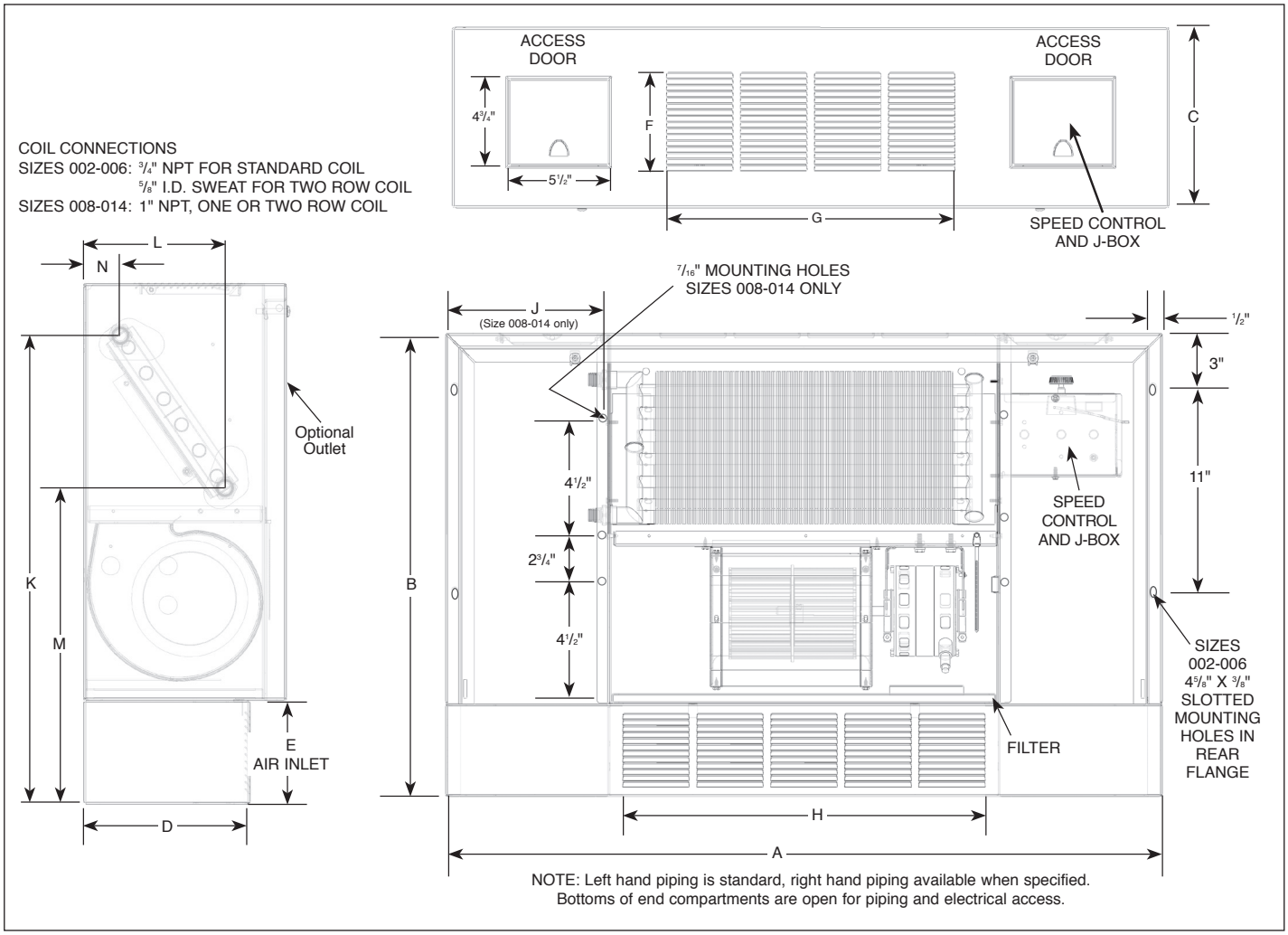
Filters

All air, both fresh and return, shall be filtered by a cleanable expanded aluminum filter.

DIMENSIONAL / MOTOR DATA

FLOOR MOUNTED

Figure 8.1 - Floor Model FC, Sizes 002-014 Steam/Hot Water Cabinet Unit Heaters



NOTE: Left hand piping is standard, right hand piping available when specified.
Bottoms of end compartments are open for piping and electrical access.

Table 8.1 - Cabinet Dimensions (inches)

Unit Size	A	B	C	D	E	F	G	H	J	Approx. Shipping Weight lbs.
002	38-3/4	25	9-3/4	8	5	5-1/8	15-5/8	19-5/8	–	80
003	43-3/4	25	9-3/4	8	5	5-1/8	19-5/8	23-5/8	–	90
004	48-3/4	25	9-3/4	8	5	5-1/8	27-5/8	27-5/8	–	110
006	61-3/4	25	9-3/4	8	5	5-1/8	39-5/8	39-5/8	–	120
008	71-3/4	28	12	10	7	5-1/8	47-5/8	30-5/8	9-3/4	160
010	71-3/4	28	12	10	7	5-7/8	47-5/8	39-5/8	9-3/4	165
012	83-3/4	28	12	10	7	5-1/8	59-5/8	51-5/8	9-3/4	185
014	83-3/4	28	12	10	7	5-7/8	59-5/8	51-5/8	9-3/4	190

Table 8.2 - Filter Dimensions (inches) ①

Model Size	Filter Size
002	8-1/2 x 20-3/4 x 1/2
003	8-1/2 x 25-3/4 x 1/2
004	8-1/2 x 30-3/4 x 1/2
006	8-1/2 x 43-3/4 x 1/2
008 & 010	10-3/4 x 49-3/4 x 1/2
012 & 014	10-3/4 x 61-3/4 x 1/2

① Filters are permanent/cleanable.

Table 8.3 - Coil Connection Dimensions (inches)

Unit Size	K	L	M	N
002 thru 006	22-1/2	7-3/8	15-1/4	2-3/8
008 thru 014	25-5/8	9-1/4	18	1-5/8

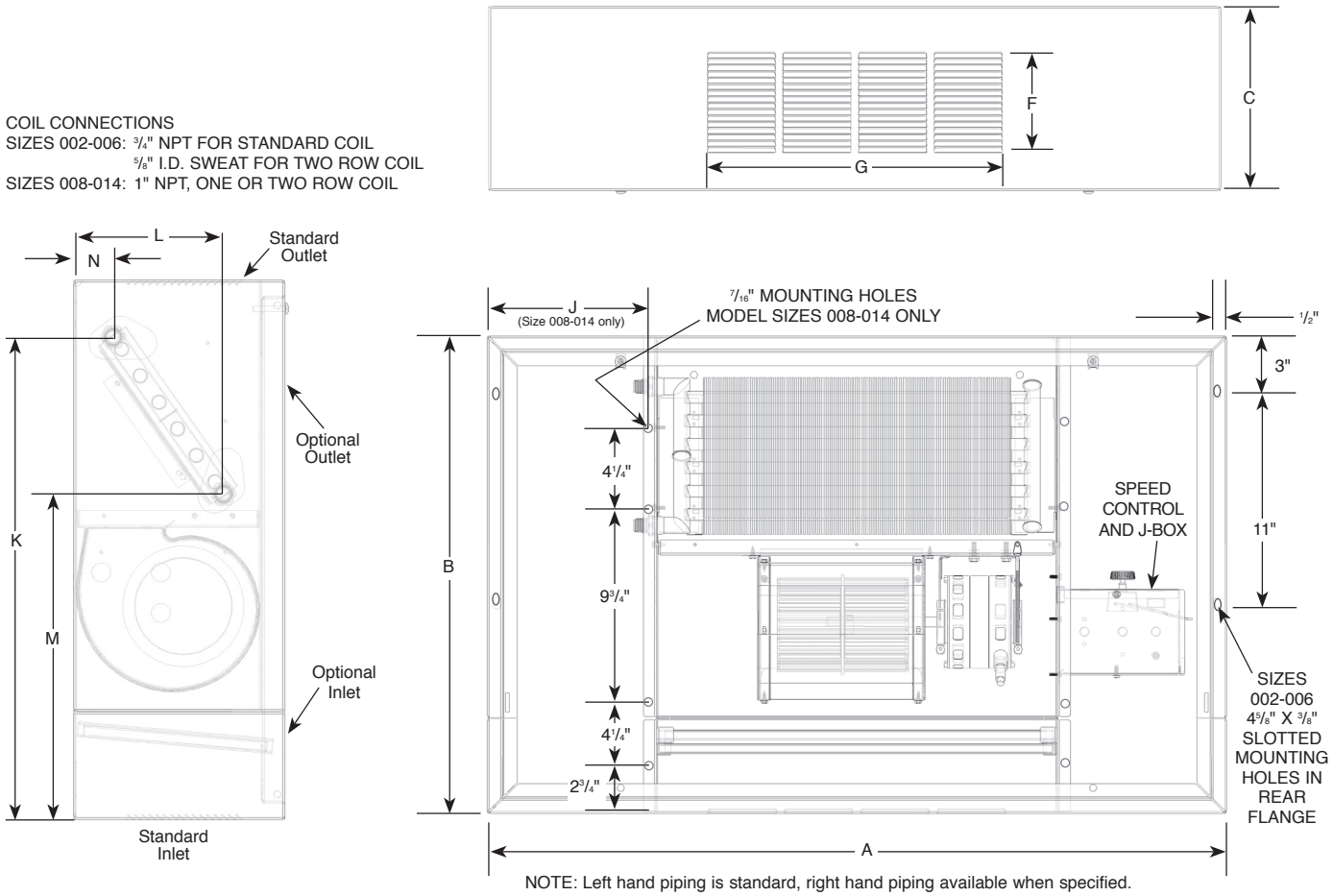
Table 8.4 - Motor Ratings (115 volts/60hz/1Ø)

Unit size	Motor qty.	Standard Motor		PSC Motor		High Static Motor	
		HP	Total Amps	HP	Total Amps	HP	Total Amps
002 & 003	1	1/30	1.7	1/30	0.70	0.4	4.60
004 & 006	1	1/20	2.37	1/20	1.05	0.4	4.60
008 & 010	1	1/30	4.07	1/30	1.75	0.8	9.20
	1	1/20		1/20		0.8	
012 & 014	2	1/20	4.74	1/20	2.10	0.8	9.20

DIMENSIONAL / MOTOR DATA

EXPOSED OR RECESSED WALL/CEILING MOUNTED

Figure 9.1 - Wall or Ceiling Model WCC. Sizes 002-014 Steam/Hot Water Cabinet Unit Heaters ①



NOTE: Left hand piping is standard, right hand piping available when specified.
Bottoms of end compartments are open for piping and electrical access.

Table 9.1 - Cabinet Dimensions (inches)

Unit Size	A	B	C	F	G	J	Approx. Shipping Weight lbs.
002	38-3/4	25	9-3/4	5-1/8	15-5/8	–	90
003	43-3/4	25	9-3/4	5-1/8	19-5/8	–	100
004	48-3/4	25	9-3/4	5-1/8	27-5/8	–	120
006	61-3/4	25	9-3/4	5-1/8	39-5/8	–	130
008	71-3/4	28	12	5-1/8	47-5/8	9-3/4	170
010	71-3/4	28	12	5-7/8	47-5/8	9-3/4	175
012	83-3/4	28	12	5-1/8	59-5/8	9-3/4	195
014	83-3/4	28	12	5-7/8	59-5/8	9-3/4	200

Table 9.2 - Filter Dimensions (inches) ①

Model Size	Filter Size
002	8-1/2 x 20-3/4 x 1/2
003	8-1/2 x 25-3/4 x 1/2
004	8-1/2 x 30-3/4 x 1/2
006	8-1/2 x 43-3/4 x 1/2
008 & 010	10-3/4 x 49-3/4 x 1/2
012 & 014	10-3/4 x 61-3/4 x 1/2

① Filters are permanent/cleanable.

Table 9.3 - Coil Connection Dimensions (inches)

Unit Size	K	L	M	N
002 thru 006	22-1/2	7-3/8	15-1/4	2-3/8
008 thru 014	25-5/8	9-1/4	18	1-5/8

Table 9.4 - Motor Ratings (115 volts/60hz/1Ø)

Unit size	Motor qty.	Standard Motor HP	Standard Motor Total Amps	PSC Motor HP	PSC Motor Total Amps	High Static Motor HP	High Static Motor Total Amps
002 & 003	1	1/30	1.7	1/30	0.70	0.4	4.60
004 & 006	1	1/20	2.37	1/20	1.05	0.4	4.60
008 & 010	1	1/30	4.07	1/30	1.75	0.8	9.20
	1	1/20		1/20		0.8	
012 & 014	2	1/20	4.74	1/20	2.10	0.8	9.20

DIMENSIONAL DATA - ACCESSORIES / OPTIONS

Figure 10.1
Model WCC - Duct Collars

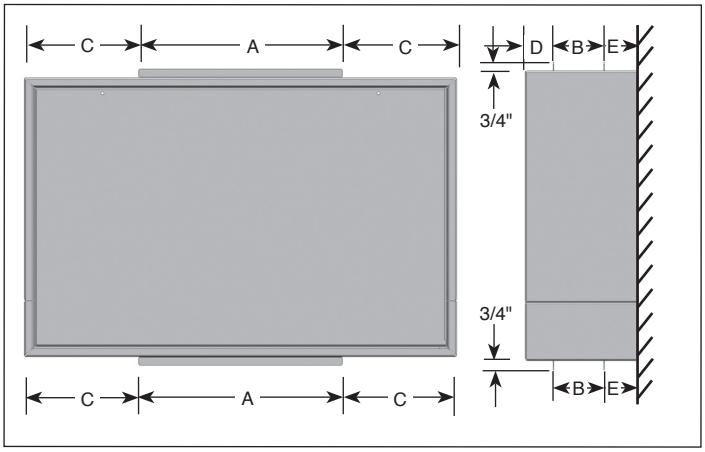


Table 10.1 ① ②
Model WCC
100% Air Inlet or Outlet Duct Collars

Unit Size	A	B	C	D	E
002	18-1/4	4-1/4	10-3/8	2-1/2	3
003	23-1/4	4-1/4	10-3/8	2-1/2	3
004	28-1/4	4-1/4	10-3/8	2-1/2	3
006	41-1/4	4-1/4	10-3/8	2-1/2	3
008	44-1/4	4-1/4	10-7/8	2-1/2	5-1/4
010	44-1/4	5-1/4	10-7/8	2-1/2	4-1/4
012	58-1/4	4-1/4	12-7/8	2-1/2	5-1/4
014	58-1/4	5-1/4	12-7/8	2-1/2	4-1/4

Figure 10.2
Model FC - Outside Air Duct Collar

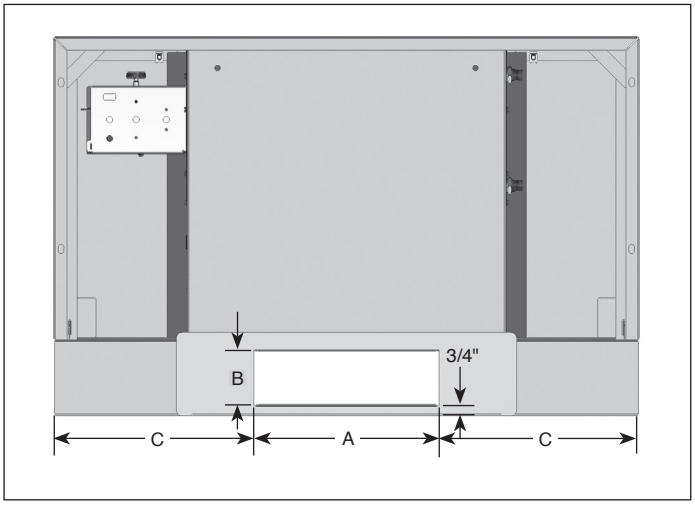
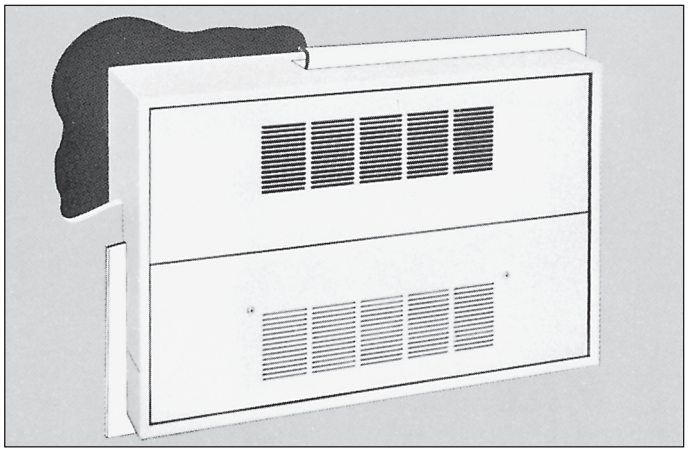


Table 10.2 ① ②
Model FC
25% and 100% Fresh Air Duct Collar

Nomen Digit 18	Outside Air Percentage					
	25%			100%		
	1, 3 or 6			2, 4 or 5		
Unit Size	A	B	C	A	B	C
002	12 1/4	3 1/2	13 1/4	18 1/2	4 1/4	10 1/8
003	12 1/4	3 1/2	15 3/4	23 1/2	4 1/4	10 1/8
004	12 1/4	3 1/2	18 1/4	28 1/2	4 1/4	10 1/8
006	12 1/4	3 1/2	24 3/4	41 1/2	4 1/4	10 1/8
008	24 1/4	3 1/2	23 3/4	44 1/2	4 1/4	13 5/8
010	24 1/4	3 1/2	23 3/4	44 1/2	5 1/4	13 5/8
012	24 1/4	3 1/2	29 3/4	58 1/2	4 1/4	12 5/8
014	24 1/4	3 1/2	29 3/4	58 1/2	5 1/4	12 5/8

① All dimensions are in inches.
② Includes 3/4" top and bottom duct flanges for duct connection.

Figure 10.3
Model WCC - Permalap Frame



MAINTENANCE / SERVICE

All heating equipment should be serviced before each heating season to assure proper operations. The following items may be required to have more frequent service scheduled based on the environment in which the unit is installed, and the frequency of the equipment operation.

Motors

A. Cleaning

Remove grease and dirt on motor during each inspection or lubrication. Open frame motors should be blown clean every heating season, or whenever coils are cleaned, whichever is sooner.

B. Lubrication

1. Lubricate motor according to manufacturer's instructions located on the motor.
2. When no motor oiling instructions are on the motor, oil the motor every two thousand hours of operation with SAE20 non-detergent motor oil for units in normal applications. Adjust oiling according to usage and atmosphere.
3. Some motors do not have oil fittings. These motors are lubricated for long life and do not require further lubrication.
4. Check motor shaft for excessive end play every 3 to 5 years.

C. Overload Protection

A change in line voltage higher or lower than motor nameplate rating may cause overheating and serious motor damage. Check plant voltage conditions. A separate manual starter with thermal overload protection device is recommended for those units that do not have motors with built-in overload protection.

Coils

A. Cleaning

Clean coil at least once a year; more often under unfavorable conditions. Unless coil is kept reasonably free of dirt, lint and grease, its original heating capacity will be reduced — possibly to a serious degree, and motor damage may result.

Two commonly used cleaning methods are:

1. Loosen dirt by brushing fins with a soft brush on side where air enters coil and then turn on fan to blow dirt from unit.
2. Use high pressure air hose to loosen dirt by blowing from side where air leaves coil (side adjacent to louvers on blow-through units; side adjacent to fan on draw-through units).

Coils subjected to corrosive fumes should be checked and cleaned frequently.

Do not use any commercial solvent that could deteriate the coil and do not use any liquid or steam sprays that could damage electrical components.

Good filter maintenance will minimize the frequency of coil cleaning.

B. Internal Corrosion Safeguards

1. Provide controlled water treatment — don't use excess of boiler compounds. Contact your boiler compound supplier for proper usage or the services of a water treatment laboratory.
2. Periodic internal flushing of the coils is recommended in areas where water supply is suspected of causing scale. Use an alkaline-chelant solution and introduce it at the main pump of the hydronic system. Flush thoroughly.

⚠ WARNING

Using inorganic or mineral acids, such as muriatic (hydrochloric) acid, even though inhibited, may lead to severe damage including corrosion and leakage.

3. De-aerate boiler feed-water (particularly if large amount of new water is used).
4. Insure rapid continuous and adequate condensate drainage by properly sized and installed traps and piping. Check traps for sticking. Clean strainers ahead of traps. (When traps don't work, condensate accumulates in unit heater coil; water hammer results.)
5. Adequately vent each unit.
6. Use low pressure steam when possible.

Casings

A. Cleaning

1. Periodic cleaning of casings is recommended to remove dirt, grease and corrosive substances that may injure finish. Rusted or corroded spots should be cleaned and repainted.
2. Clean air filters every three months or sooner depending on dust conditions.

B. General Inspection

Tighten fan guard and motor bracket. Check fan for proper clearance, free rotation and firm connection to shaft.

When servicing is complete, tag unit to indicate date of inspection, lubrication and cleaning.

SERVICE

If a qualified service person cannot solve the problem, consult your local plumbing/electrical contractor or local Modine representative.

When servicing, repairing or replacing parts on these units always give the complete Model Number and Serial Number from the unit identification plate.

Replacement Parts

When requesting parts please contact your local representative. Please have full model and serial number available.

COMMERCIAL WARRANTY

Seller warrants its products to be free from defects in material and workmanship, EXCLUSIVE, HOWEVER, of failures attributable to the use of materials substituted under emergency conditions for materials normally employed. This warranty covers replacement of any parts furnished from the factory of Seller, but does not cover labor of any kind and materials not furnished by Seller, or any charges for any such labor or materials, whether such labor, materials or charges thereon are due to replacement of parts, adjustments, repairs, or any other work done. This warranty does not apply to any equipment which shall have been repaired or altered outside the factory of Seller in any way so as, in the judgment of Seller, to affect its stability, nor which has been subjected to misuse, negligence, or operating conditions in excess of those for which such equipment was designed. This warranty does not cover the effects of physical or chemical properties of water or steam or other liquids or gases used in the equipment.

BUYER AGREES THAT SELLER'S WARRANTY OF ITS PRODUCTS TO BE FREE FROM DEFECT IN MATERIAL AND WORKMANSHIP, AS LIMITED HEREIN, SHALL BE IN LIEU OF AND EXCLUSIVE OF ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, WHETHER ARISING FROM LAW, COURSE OF DEALING, USAGE OF TRADE, OR OTHERWISE, **THERE ARE NO OTHER WARRANTIES, INCLUDING WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE, WHICH EXTEND BEYOND THE PRODUCT DESCRIPTION CONFIRMED BY BUYER AND SELLER AS OF THE DATE OF FINAL AGREEMENT.**

This warranty is void if the input to the product exceeds the rated input as indicated on the product serial plate by more than 5% on gas-fired and oil-fired units, or if the product in the judgment of SELLER has been installed in a corrosive atmosphere, or subjected to corrosive fluids or gases, been subjected to misuse, negligence, accident, excessive thermal shock, excessive humidity, physical damage, impact, abrasion, unauthorized alterations, or operation contrary to SELLER'S printed instructions, or if the serial number has been altered, defaced or removed.

BUYER'S REMEDY FOR BREACH OF WARRANTY, EXCLUSIVE OF ALL OTHER REMEDIES PROVIDED BY LAW, IS LIMITED TO REPAIR OR REPLACEMENT AT THE FACTORY OF SELLER, ANY COMPONENT WHICH SHALL, WITHIN THE APPLICABLE WARRANTY PERIOD DEFINED HEREIN AND UPON PRIOR WRITTEN APPROVAL, BE RETURNED TO SELLER WITH TRANSPORTATION CHARGES PREPAID AND WHICH THE EXAMINATION OF SELLER SHALL DISCLOSE TO HAVE BEEN DEFECTIVE; EXCEPT THAT WHEN THE PRODUCT IS TO BE USED BY BUYER AS A COMPONENT PART OF EQUIPMENT MANUFACTURED BY BUYER, BUYER'S REMEDY FOR BREACH, AS LIMITED HEREIN, SHALL BE LIMITED TO ONE YEAR FROM DATE OF SHIPMENT FROM SELLER. FOR GAS-FIRED PRODUCTS INSTALLED IN HIGH HUMIDITY APPLICATIONS AND UTILIZING STAINLESS STEEL HEAT EXCHANGERS, BUYER'S REMEDY FOR BREACH, AS LIMITED HEREIN, SHALL BE LIMITED TO TEN YEARS FROM DATE OF SHIPMENT FROM SELLER.

These warranties are issued only to the original owner-user and cannot be transferred or assigned. No provision is made in these warranties for any labor allowance or field labor participation. Seller will not honor any expenses incurred in its behalf with regard to repairs to any of Seller's products. No credit shall be issued for any defective part returned without proper written authorization (including, but not limited to, model number, serial number, date of failure, etc.) and freight prepaid.

OPTIONAL SUPPLEMENTAL WARRANTY

Provided a supplemental warranty has been purchased, Seller extends the warranty herein for an additional four (4) years on certain compressors. Provided a supplemental warranty has been purchased, Seller extends the warranty herein for an additional four (4) years or nine (9) years on certain heat exchangers.

EXCLUSION OF CONSUMABLES & CONDITIONS BEYOND SELLER'S CONTROL

The above referenced warranty shall not be applicable to any of the following items: refrigerant gas, belts, filters, fuses and other items consumed or worn out by normal wear and tear or conditions beyond Seller's control, including (without limitation as to generality) polluted or contaminated or foreign matter contained in the air or water utilized for heat exchanger (condenser) cooling or if the failure of the part is caused by improper air or water supply, or improper or incorrect sizing of power supply.

Component Applicable Models	**"APPLICABLE WARRANTY PERIOD"**
Heat Exchangers Gas-Fired Units except PSH/BSH	TEN YEARS FROM DATE OF FIRST BENEFICIAL USE BY BUYER OR ANY OTHER USER, WITHIN TEN YEARS FROM DATE OF RESALE BY BUYER OR ANY OTHER USER, WITHIN TEN YEARS FROM DATE OF RESALE BY BUYER IN ANY UNCHANGED CONDITION, OR WITHIN ONE HUNDRED TWENTY-SIX MONTHS FROM DATE OF SHIPMENT FROM SELLER, WHICHEVER OCCURS FIRST
Heat Exchangers Low Intensity Infrared Units **Compressors** Condensing Units for Cassettes	FIVE YEARS FROM DATE OF FIRST BENEFICIAL USE BY BUYER OR ANY OTHER USER, WITHIN FIVE YEARS FROM DATE OF RESALE BY BUYER OR ANY OTHER USER, WITHIN FIVE YEARS FROM DATE OF RESALE BY BUYER IN ANY UNCHANGED CONDITION, OR WITHIN SIXTY-SIX MONTHS FROM DATE OF SHIPMENT FROM SELLER, WHICHEVER OCCURS FIRST
Burners Low Intensity Infrared Units **Other** Components excluding Heat Exchangers, Coils, Condensers, Burners, Sheet Metal	TWO YEARS FROM DATE OF FIRST BENEFICIAL USE BY BUYER OR ANY OTHER USER, WITHIN TWO YEARS FROM DATE OF RESALE BY BUYER IN ANY UNCHANGED CONDITION, OR WITHIN THIRTY MONTHS FROM DATE OF SHIPMENT FROM SELLER, WHICHEVER OCCURS FIRST
Heat Exchangers/Coils Indoor and Outdoor Duct Furnaces and System Units, PSH/BSH, Steam/Hot Water Units, Oil-Fired Units, Electric Units, Cassettes, Vertical Unit Ventilators, Geothermal Units **Compressors** Vertical Unit Ventilators, Geothermal Units **Burners** High Intensity Infrared Units **Sheet Metal Parts** All Products	ONE YEAR FROM DATE OF FIRST BENEFICIAL USE BY BUYER OR ANY OTHER USER, WITHIN ONE YEAR FROM DATE OF RESALE BY BUYER IN ANY UNCHANGED CONDITION, OR WITHIN EIGHTEEN MONTHS FROM DATE OF SHIPMENT FROM SELLER, WHICHEVER OCCURS FIRST

As Modine Manufacturing Company has a continuous product improvement program, it reserves the right to change design and specifications without notice.

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